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EVALUATION OF DIETARY SUPPLEMENTATION OF A NOVEL MURAMIDASE TO WHEAT-SOYA DIETS ON BROILER PRODUCTION EFFICIENCY IN THE PRESENCE OF FEED ENZYMES AND COCCIDIOSTAT

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Muramidase enzymes can hydrolyse peptidoglycan, the main structural polymer of bacterial cell walls. When released into the gut during natural bacterial turnover, peptidoglycan in bacterial cell debris may detriment gastrointestinal functionality. Indeed, supplementation of a novel microbial muramidase (Balancius™) has been shown to benefit growth performance and gastrointestinal functionality in broilers (1,2,3).

Here, we evaluated the effect of Balancius™ in practical diets, supplemented with phytase, xylanase and a coccidiostat on growth performance, litter quality and footpad dermatitis of male broilers. Control wheat-soya bean meal based diets (T1) were supplemented with muramidase at 25,000 (T2), 35,000 (T3) or 45,000 (T4) LSU(F)/kg feed. The four dietary treatments were allocated to 96 pens, each with ten day-old Ross 308 male broilers in a randomized block design (n=24), using a three phase feeding strategy with starter (d0-10; crumbs), grower (d10-21; pellets) and finisher (d21-35; pellets) diets. From d14 to d18, feed was removed for 4 h/d from 8 am to induce a mild gut health disturbance. Analysis of variance showed that muramidase supplementation increased final bird weight from 2685 to 2772, 2804 and 2848 g (s.e.d. 32 g; P<0.001) and average feed intake from 3746 to 3816, 3887 and 3913 g (s.e.d. 41 g; P<0.001) for T1, T2, T3 and T4, respectively. This resulted in an improved mortality corrected feed conversion from 1.420 to 1.401, 1.414 and 1.401, respectively (s.e.d. 0.005; P<0.001). These beneficial impacts on broiler production efficiency were achieved largely over the first 21 days, and most pronouncedly during the grower phase, when the mild gut health disturbance was induced. In this study, muramidase supplementation did not affect litter score, pH, dry matter or nitrogen content at d35, which averaged 2.1±0.03, 8.28±0.050, 56.9±1.91% and 1.9±0.05%, respectively. Footpad dermatitis incidence at d35 was low and did not differ between treatments. We concluded that in the presence of a mild gut challenge but otherwise good rearing conditions, dietary supplementation of Balancius™ on top of feed enzymes and a coccidiostat significantly improved broiler production efficiency during the starter and grower phase, which carried through to five weeks of age.

- (1) Lichtenberg et al 2017. Regul Toxicol Pharmacol 89, 57-69
(2) Goodarzi Borojeni et al 2019. Poult Sci 98, 2080-2086
(3) Sais et al 2019. Poult Sci in press; doi.org/10.3382/ps/pez466